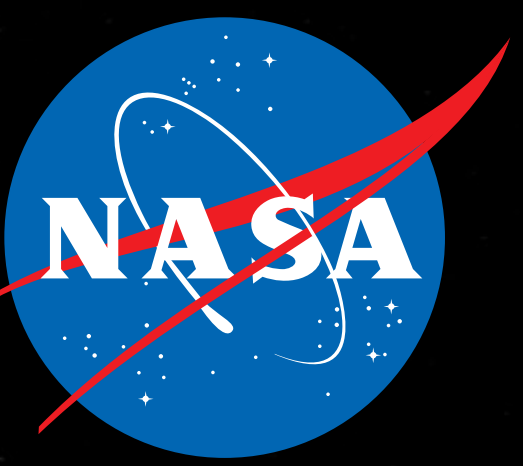


The Geospace Dynamics Observatory (GDO)

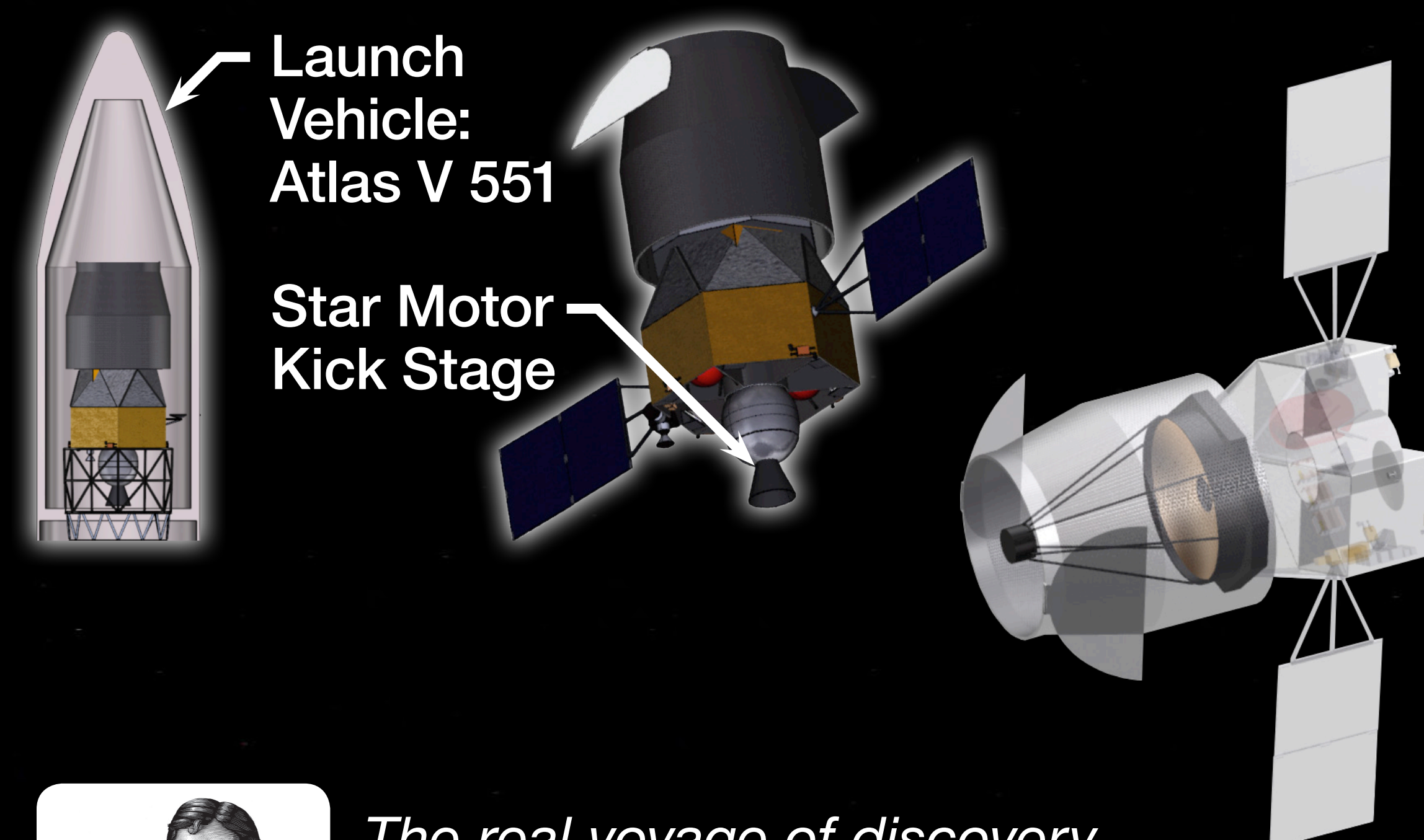
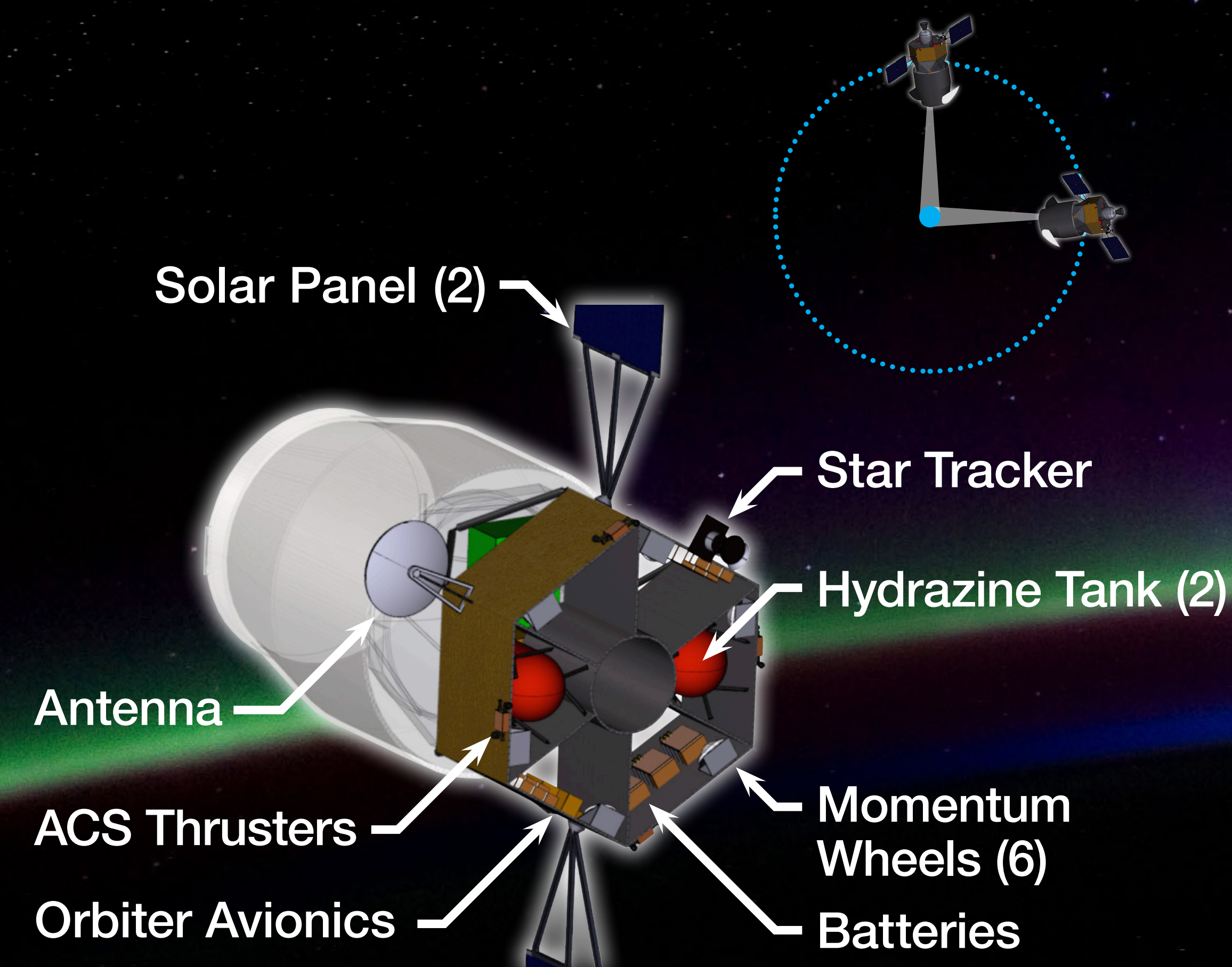
A paradigm-changing geospace mission

National Aeronautics and
Space Administration



GDO Mission Concept

- Orbit: 60-Re circular polar orbit = 27-day period, long-term viewing of regions of interest
- 2.4-m optics = required sensitivity for faint signals
- 1.5-degree FOV = full access to near-Earth space



GDO Optics & Instruments

The GDO mission observes geospace with unprecedented resolution, scale, and sensitivity using:

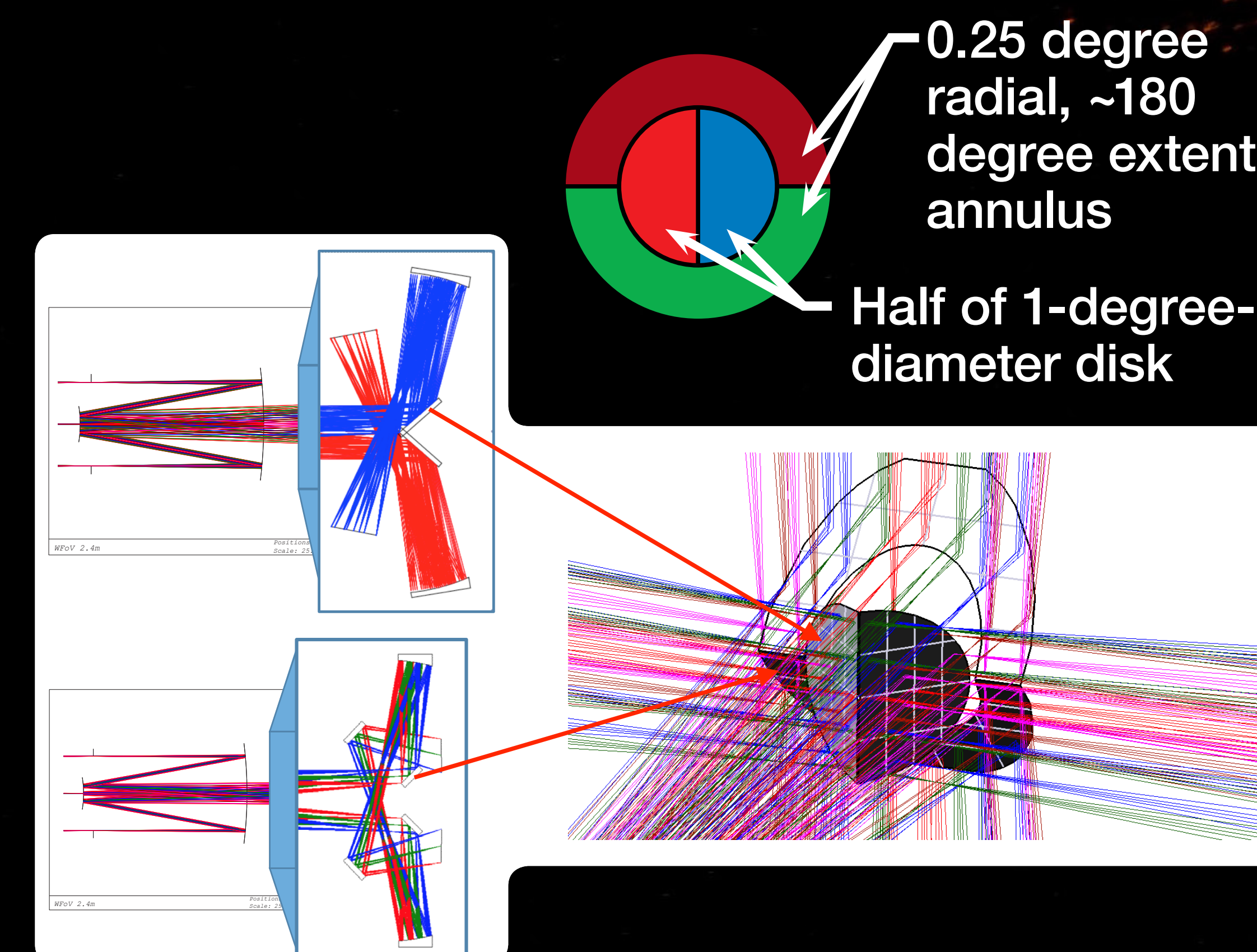
- Three far ultraviolet, co-aligned simultaneous auroral imagers—135, 150, 170 nm, 4 nm FWHM
- An extreme ultraviolet, wide field-of-view plasmasphere imager—30.4 nm
- A spectrometer in the near to far ultraviolet range that will probe any portion of the disk and simultaneously observe the limb—120–300 nm, 1 nm resolution

The GDO optical design

- Separates the FOV into reduced regions
- Each region can be corrected individually

The GDO measurement characteristics

- Full Earth disk image composite
- Spatial resolution of <2 km at nadir
- Pointing accuracy 0.2 arcsec
- Pointing resolution 0.5 km, knowledge 0.2 km
- Integration time of 1 sec
- Sensitivity of 100 R with SNR = 5 per pixel, per 1-sec image



Revolutionary scientific advances enabled by GDO

- Unparalleled advances in the connection of the upper atmosphere to the Sun
- Advances in the influence of waves and tides on the upper atmosphere
- The ability to probe the mechanisms that control the evolution of planetary atmospheres

GDO provides the first...

- Full near-Earth imagery of the storm and circulation systems of the upper atmosphere
- Observations of the ionosphere on a global and long-time scale basis with unprecedented resolution
- Probe of the mechanisms that control the evolution of planetary atmospheres
- Test of our understanding of how the Earth is connected to our own star on a global scale

Value Proposition

- Provides revolutionary observations of geospace required for scientific understanding the coupled Sun-Earth System—the key theme of the 2012 Solar and Space Physics Decadal Survey
- Serves the nation by enabling predictive space weather capability for the near-Earth space environment where the nation's space assets and ground systems reside and are impacted



The real voyage of discovery consists not in seeking new landscapes, but in having new eyes.
—Marcel Proust, 1871–1922